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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR AUGUST 1935

Vol. II, No. 10 (Not for publication) October 1, 1935

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE OCCUPIES NEW LABORATORY AT BELTSVILLE, MD.

The moving of laboratories into the new quarters at Beltsville Research Center has been completed. Most of the investigations now are being continued, after the interruption necessitated by the moving. The new buildings at Beltsville provide much more satisfactory quarters for work than were previously available. The activities centered there are work on bee culture, previously conducted at Somerset, Md.; investigations on the physiology and toxicology of insects; on insects affecting apple, households, stored products, and poultry, previously conducted at Takoma Park, Md.; and on greenhouse insects, formerly headquartered in buildings on the Department grounds near Constitution Avenue and 12th Street. Certain activities on insecticides are also being carried on at Beltsville.

In addition to the laboratory building, suitable laboratory and office space is provided in the headhouses of the four large greenhouses, which are semifire-proof structures of brick and concrete. An up-to-date mushroom house has been built, where the work in connection with insect pests of mushrooms will be centered.

The work carried on at Beltsville is under the direction of six research divisions of the Bureau. To coordinate the fiscal and administrative activities, a committee has been designated to handle matters of common business operations. The committee consists of J. I. Hambleton, Chairman; E. H. Siegler; and F. L. Campbell.

FRUIT INSECT INVESTIGATIONS

Damage to drying apricots by flies.--Perez Simmons, Fresno, Calif., reports that during the summer H. C. Donohoe investigated damage being done by flies, chiefly *Lucilia sericata* Meig., to freshly cut and drying apricots in the Sacramento Valley. The flies were swarming on the cutters and on the cut fruit, which was polluted with fly specks. Drying yards in the vicinity of cow barns and horse stables were most heavily infested. A test was made of shade-cloth protection over six trays of apricots, with controls from the same lot. Both protected and control fruit were exposed to flies before sulphuring, the comparison being made after sulphuring while the fruit was drying in the sun. The cloth was stretched over the trays and was slightly above the fruit by the low side and end cleats of the trays. The apricots were sampled on June 21 after 3 days' exposure, and on June 23 the samples were examined for fly specking. The results are given in the following table.

Extent of injury	Sample Covered (158 pieces)	 Exposed (296 pieces)
	Percent	Percent
None	76.0	6.8
Slight (less than 5 specks per piece)	21.5	40.2
Moderate (5 to 14 specks per piece)	2.5	40.2
Heavy (15 or more specks per piece)	0.0	12.8
Total fly-specked pieces	24.0	93.2

In addition to protecting the fruit during drying, it is evident that the shade cloths should also prevent the flies from feeding on the freshly cut fruit prior to sulphuring.

MEXICAN FRUIT FLY CONTROL

Only one Mexican fruit fly trapped.--Only one adult Anastrepha ludens Loew was trapped in Texas in August, this being taken in Laredo, Webb County, on August 2. No A. ludens has been trapped in the lower Rio Grande Valley since early in May. Insects generally, and other Trypetidae in particular, have been unusually scarce throughout the month. For the same month last year many more A. serpentina Wied. and A. fraterculus auct. were taken, as well as other Diptera.

DATE SCALE CONTROL

No date scale found.--Inspection was continued in the Indio, Calif., district during the month of August. A total of 8,527 palms were inspected and no scale was found. In the Imperial Valley 1,625 palms were inspected in the area surrounding the most recent infestation and no scale was found. No scale has been found in the Imperial Valley during the past 18 months.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Pentatomids feed on alfalfa seeds within developing pods.--O. L. Barnes, Tempe, Ariz., found pentatomids feeding on and destroying many alfalfa seeds. In test cages the number of seeds destroyed daily per individual was surprisingly large and shows the damage that may be expected from these insects. He reports as follows: "Four species of pentatomids have been observed feeding at immature seed pods of alfalfa in the field in Arizona. Adults of these species were confined in lantern-globe cages and supplied with branches of alfalfa bearing immature pods. The alfalfa stems were inserted in a bottle of water to prevent rapid drying of the food. The cages were kept in an insectary room with two screened and two partially walled sides. The tests were made between July 1 and August 10. The range of the standard shade temperatures at Tempe, when the different experiments were carried out, was: Maximum, 98° to 108° F.; minimum, 68° to 77°; average daily mean, 86° to 91°. The number of 'insect days' per test ranged from 9 to 20. The species and the respective average number of alfalfa seeds punctured per day per bug were as follows: Chlorochroa sayi Stal., 32.5; C. ligata Say, 22.6; Thyanta custator Fab., 22.3; Euschistus impictiventris Stal., 5. E. impictiventris was observed to feed at the stems of the alfalfa more than any other species. Similar feeding tests were made using C. sayi nymphs of different instars. The average number of alfalfa seeds punctured per day by nymphs of each instar were as follows: First instar, 0; second instar, 1.7; third instar 7.4; fourth instar, 15; fifth instar, 36.8."

Collyria calcitrator Grav., a valuable wheat-stem sawfly parasite.--C. C. Hill, Carlisle, Pa., reports that C. calcitrator, an important parasite of the wheat-stem sawfly, has been introduced into parts of Pennsylvania and Ohio where sawflies have been doing considerable damage. Through the courtesy of the Canadian Department of Agriculture, shipments of 11,700 parasites were obtained and releases were made in Pennsylvania at points near Cabot, Butler, Shelocta, Marion, Center, Williamsport, Carlisle, Roxbury, and Red Lion, and in Ohio at points near North Lima, Elliotsville, and Hubbard. Most of the actual work of releasing was done by E. J. Udine, Carlisle. The Canadian Department of Agriculture had previously introduced this parasite from Europe.

Hairy vetch bruchid in the Carolinas and Maryland.--According to J. S. Pinckney, Carlisle, the egg-laying period of Bruchus brachialis Fahr. in the vicinity of Salisbury, N. C., this year covered the period from the first week in May until about June 22. The infestation was heavy and few pods escaped attack. The length of the larval stage is about 2 weeks, not including the 2-day period of the prepupal stage. Larvae entering seed on June 10 were entering the prepupal stage on the 24th. This species has been found working in vetch near Hagerstown, Md., by Messrs. Hill and Udine. Although it was found nearby in Pennsylvania last year and again this year, this is the first record of its occurrence in Maryland.

Extreme southern distribution of certain hessian fly parasites.--Mr. Hill also reports that Eupelmus allynii French was recovered from hessian fly puparia near Cowpens and Chapin, S. C.; Merisus destructor (Say) near Cowpens; and Ditropinotus aureoviridis Cwfd. near Chapin. None of these parasites has heretofore been reported in hessian fly from South Carolina.

Heavy hessian fly infestations follow sawfly damage.--Mr. Udine reports finding heavy hessian fly infestations in regions where sawflies caused the most damage in wheat last year. He attributes this partly to the abundance of volunteer wheat last fall caused by heavy lodging from sawfly damage. The lodged grain afforded a good harbor for overwintering hessian fly, resulting in a heavy emergence last spring.

Rearing and digging of grubs.--T. R. Chamberlin and Lee Seaton, Madison, Wis., report that preliminary digging in seven areas in the Madison and Blue Mounds districts showed grub populations ranging from approximately 27,000 to 1,060,000 per acre. The highest grub populations were not found in the districts where adults were most numerous during the flight period. Based on our present knowledge, the larvae found belonged to the hirticula-rugosa group, the fusca-implicita group, and the tristis group. Larvae of Phyllophaga rugosa Melsh, P. hirticula Knoch, and P. implicita Horn have been reared in the laboratory to second stage, and second- and third-stage larvae of P. tristis Fab. have been taken in the field. Newly issued adults of P. tristis were found in the soil late in August.

Sprayed hay not held responsible for death of cattle.--George I. Reeves, Salt Lake City, Utah, reports that a case of arsenical poisoning of cattle at Grand Junction, Colo., alleged to have been caused by feeding hay that had been sprayed for control of the alfalfa weevil, has been investigated. The attending veterinarian stated that the symptoms of the sick cattle were exactly similar to those described by Wakeland in 1924 in a case which was observed throughout by a trained veterinarian and pronounced due to overfeeding of new hay. The samples of the Grand Junction hay, which were analyzed for G. M. List, of the Colorado Experiment Station, were found to contain only insignificant quantities of arsenic--0.155 grains per pound, as against 0.3 in the case reported by Wakeland.

Redwinged blackbirds feed extensively on grasshoppers in Sacramento Valley.--C. C. Wilson, Sacramento, Calif., reports that the redwinged blackbird (Angelaius tricolor) was observed to feed extensively on grasshoppers during August in the Sacramento Valley. Large numbers of grasshoppers were forced to migrate to narrow strips of alfalfa left uncut in the center of the fields and these strips, in turn, became feeding centers for the redwinged blackbirds. With the aid of Joseph Keyes and J. A. Neff, of the Biological Survey, ten birds were killed on August 30 and the contents of their gullets and gizzards were examined. The results are shown in the following table.

Bird No.	Contents of gullets and gizzards	
	Weed seed [1]	Insects or insect parts
	cc	
1----------	0.8	4 *Melanoplus marginatus* Scudd., 1 leafhopper
2----------	0.9	4 *M. marginatus*, 6 pairs grasshopper mandibles, and 1 plant bug
3----------	0.5	4 *M. marginatus*, 20 pairs grasshopper mandibles
4----------	1.1	1 *M. marginatus*, 15 pairs grasshopper mandibles
5----------	1.0	1 *M. marginatus*, 2 pairs grasshopper mandibles, 1 *Stictocephala festina* Say, 1 *jassid*, 1 full-grown larva of *Prodenia praefica* Grote, 1 quarter-grown larva of *Eurymus eurytheme* Bdv.
6----------	0.2	2 *M. marginatus*, 15 pairs of grasshopper mandibles, and 5 jassids
7----------	1.3	14 pairs of grasshopper mandibles
8----------	1.4	4 *M. marginatus*, 14 pairs of grasshopper mandibles, and 1 flea beetle
9----------	0.5	6 *M. marginatus*, 7 pairs of grasshopper mandibles, and 1 half-grown larva of *P. praefica*
10---------	0.5	7 *M. marginatus*, 16 pairs of grasshopper mandibles

[1] Weed seed consisted largely of water grass, with some dock and wild oats.

The examinations showed that a large part of the food eaten by the blackbirds at this time consisted of insects. The practical value of leaving the narrow strips of alfalfa as traps and feeding units in the infested fields was demonstrated by the complete destruction of the grasshoppers by the birds. The death of female grasshoppers in the strips observed at this time should decrease the 1936 population in this field from 15 to 30 percent, considering each female as the potential depositor of at least two egg pods.

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JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Sugarcane a possible host plant of Japanese beetle.--Through the courtesy of the Division of Cereal and Forage Insect Investigations, a number of sugarcane cuttings were obtained from Louisiana in April 1935. T. N. Dobbins, Moorestown, N. J., reporting on the investigations to determine whether or not sugarcane may become a host plant of this beetle, found that Japanese beetle grubs will feed on the roots of sugarcane. Thirty-six cuttings were potted in 10-inch pots and on May 1 the sprouted plants were infested with healthy third-instar larvae. Twelve pots were infested with 25 larvae per pot; 12 with 15 grubs per pot; and 12 were left without grubs, as checks. By May 15 the effect of larval feeding was noticeable. Considerable stunting of the plants and tip-burn occurred on the more heavily infested plants. On July 1, 3 plants in each group were examined and the roots of the more stunted plants were found to be almost completely destroyed. On July 1 a group of uninfested plants were set out in a cornfield near Shiloh, N. J., where the beetles are very abundant. These plants were examined at intervals during the feeding period of the adult beetle, but no evidence of feeding on the leaves was observed.

Milky disease of Japanese beetle larvae.--S. R. Dutky, Moorestown, reports that during the month of August the number of diseased larvae found at the regular larval-survey stations constantly increased in numbers, the smooth weekly figures being 7, 9, 25, 44, and 66. Of a total of 151 cases reported, 149 were the milky disease. The first milky-diseased first-instar larvae were picked up on August 8 and the first milky-diseased second-instar larvae were found on August 21. No third-instar larvae have been reported as affected. Artificial infection with the milky disease has been accomplished with *Popillia japonica* Newm., *Ochrosidia villosa* Burm., *Autoserica castanea* Arrow, and *Phyllophaga* larvae.

Protection of small and bush fruits from injury by adult beetles.--F. W. Metzger, Moorestown, reports that during the early part of the month the height of the beetle season was reached at Whitesbog, N. J., where traps are being used as a control for the beetle on cultivated blueberries. In general, the injury on the plants does not appear to be so severe as that observed during previous years. One field, located at a greater distance to the west than any of the others from the heavily infested beetle area, has always had a serious beetle infestation, for no apparent reason. The pine barrens at this point are generally infested, but there is no great concentration of beetles at any given point. Tests conducted during the month seem to indicate, however, that considerable numbers of beetles are attracted from the pines to the field, whether the wind is blowing from the field or to it. As traps located at some distance from the field do not capture as many beetles as those located along the edge of the cultivated area, it appears that the plants themselves exercise a considerable attraction for the beetle. Marked beetles were liberated 1 mile east of the field on days when the wind was blowing from the east and on other days when the wind was blowing from the west.

Approximately 2 hours after liberation, marked beetles were captured in the traps, regardless of wind direction. The insects apparently fly with the wind when there is no definite attraction but against the air currents when attracted to a certain locality.

Stomach poisons and repellents for adult Japanese beetle.--Tests were made this season by W. E. Fleming and F. E. Baker, Moorestown, with compound arsenates of the alkali and alkaline earth metals, prepared by the Division of Insecticide Investigations. As these materials had a very high water-soluble arsenic, they were mixed with an equal weight of hydrated lime before applying to the test plants. Materials used were calcium ammonium arsenate, calcium potassium arsenate, calcium sodium arsenate, and magnesium ammonium arsenate. These compound arsenates were not as effective as stomach-poison insecticides against the Japanese beetle as was acid lead arsenate. In view of the high water-soluble arsenic, there is a hazard in applying the materials to foliage.

"Oil greens" of little value for Japanese beetle.--Further experiments were conducted with different homologs of paris green prepared by the Division of Insecticide Investigations to determine their relative effectiveness against the adult beetle. It was apparent that these "greens" have little value as stomach-poison insecticides against the Japanese beetle.

Field treatment of nursery stock to destroy immature stages of Japanese beetle.--W. E. Fleming, F. E. Baker, and L. Koblitsky, Moorestown, report that in determining the absorption of arsenic by nursery plants growing in plots treated with acid lead arsenate, needles from *Buxus sempervirens*, *Pinus resinosa*, *Thuja orientalis*, *Thuja occidentalis*, *Tsuga canadensis*, *Juniperus virginiana*, and *Juniperus communis*, and leaves from *Clematis paniculata*, *Cercis chinensis*, *Cornus florida*, *Cornus alba*, *Callicarpa purpurea*, and *Deutzia gracilis* were analyzed for arsenic. The following table shows the arsenic content of the needles and leaves.

Shrub or vine	Parts As_2O_3 per million in plants treated with lead arsenate at rate of--		
	1,000 lbs. per acre	1,500 lbs. per acre	2,000 lbs. per acre
Buxus sempervirens------	0.000	0.350	1.875
Pinus resinosa----------	0.125	0.225	4.625
Thuja orientalis-------	0.000	0.000	5.875
Thuja occidentalis-----	0.250	0.500	3.750
Tsuga canadensis-------	0.000	0.000	1.000
Juniperus virginiana---	0.000	0.000	1.375
Juniperus communis-----	0.000	0.000	2.000
Clematis paniculata----	0.250	0.750	1.000
Cercis chinensis--------	0.000	0.000	14.500
Cornus florida----------	0.000	0.000	3.750
Cornus alba------------	0.000	0.000	6.500
Callicarpa purpurea----	0.250	0.500	0.850
Deutzia gracilis--------	0.000	0.000	5.900

Leaf samples for arsenic analysis were taken from Euonymus europaeus, Philadelphus coronarius, Lonicera fragrantissima, Lonicera morrowi, Lonicera tatarica, Rosa gardenia, Rosa sp. (Dr. Van Fleet), and Deutzia lemoinei.

Dispersion of Tiphia popilliavora Rohw., an imported parasite of the Japanese beetle.--M. H. Brunson, Moorestown, reporting on the status of the introduced parasite T. popilliavora, states that a total of 134 colonies of this species, each consisting of 100 females, were liberated in Pennsylvania and New Jersey during the month. The material used for this purpose was obtained by collecting from previously established colonies. A total of 13,715 female Tiphia were collected in 14 days at the rate of 298 females per day per man. Several colonies established in recent years were scouted to determine the spread of the parasite. It was found that the insect had spread distances from 1/2 to 2 miles from the original points of liberation. Observations also indicated that a continuance of carrot, the apparent sole food of T. popilliavora, is not necessary for the spread of the parasite. It was observed that in the area of spread of the parasite, there were frequently intervals of several hundred yards in which no wild carrot was to be found, and apparently it had not grown in these places for some years. It now appears that the presence of wild carrot is not absolutely essential for dispersion of the parasite. Forty-one colonies originally liberated in 1931 were scouted and recoveries of T. popilliavora were made at 19 of these.

JAPANESE BEETLE CONTROL

Corn borer scouting and survey started.--Work under an allotment of $116,000 for scouting and survey work in 19 States to determine possible spread and extent of infestation of the European corn borer was started during the week of August 12. This work is to be performed in order that measures may be taken by affected States and growers to control and delay further spread of the borer. Both scouting and survey work are to be performed in New Jersey, Virginia, Indiana, and Michigan. Scouting only will be carried on in Pennsylvania, Delaware, Maryland, Kentucky, Illinois, West Virginia, and Wisconsin. Operations in the 6 New England States and in New York and Ohio will be confined to a survey to determine the degree of infestation. Six district supervisors from the permanent corn borer inspection force were placed in the field to organize the work.

New infestations in nurseries.--Nursery and greenhouse scouting was completed in August in all except the New England States. Scouting in Connecticut, New Hampshire, and Maine will be discontinued on September 7 and in the remaining States on September 14. Similar activities in the regulated States south of Pennsylvania were terminated about the middle of August. August 31 was the date for discontinuing scouting of classified nurseries and greenhouses in Pennsylvania, New Jersey, and New York. A number of new infestations have been discovered on nursery premises in Maryland. Scouting in northern New Jersey has added greatly to the list of Class III establishments. At the conclusion of the scouting season there remained but few uninfested, classified establishments in the State. Many new infestations have been found in nurseries in Lancaster, York, Berks, and Dauphin Counties, Pa. No new finds have been made in the northern section of Pennsylvania. In New England beetles were found on the premises of 6 nurseries in Connecticut and within 500 feet of 6 other nurseries in that State. In Massachusetts beetles were collected on the properties of 2 nurseries. These New England finds were made during the first scouting of the premises this season. If possible, six scoutings will be made of the classified establishments in New England.

Fruit and vegetable inspection at peak.--A maximum of 123 employees was used during the month at the 37 fruit and vegetable inspection points established at important shipping points throughout the regulated area. Inspections at the Fredericksburg, Va., center required the employment of 19 inspectors. Owing to the large number of vehicles arriving with products for certification, causing traffic congestion in the Southwest Market in Washington, D. C., it was necessary to move the inspection platform at that point to a nearby parking lot. Beetles were found on cabbage, beans, and spinach at the inspection platforms in both Fredericksburg and Washington. Large quantities of beans were certified for movement from the Norfolk, Va., district. From June 15 to August 31, 2,159 beetles were removed from farm products and cut flowers inspected in the Philadelphia district. In general, the inspection of farm products in New Jersey was not as active as was anticipated. Bumper crops in Midwestern States practically closed the outlet for New Jersey products. Flight of the adult beetle decreased in the heavily infested area to such an extent that fumigation requirements on refrigerator cars containing bananas, onions, and potatoes were withdrawn late in August.

Japanese beetle trapping concluded in six States.--Trapping for the season in cities outside the regulated areas was largely concluded by the end of August. Traps had been lifted in all trapped cities in the States of Maryland, Michigan, North Carolina, South Carolina, Virginia, and West Virginia. Trap lifting was in progress in New York and Ohio. Still remaining in operation on August 31 were traps set in St. Louis, Mo., East St. Louis, Ill., Indianapolis, Ind., Erie, Pa., and at 18 points in Maine.

Soil treatment under way in St. Louis.--Application of arsenate of lead to infestations of the Japanese beetle disclosed by this year's trapping program outside of last season's treated area in St. Louis, Mo., began on August 8. By the end of August, 49 acres had been sprayed with lead arsenate at the rate of 1,000 pounds per acre.

High degree of gypsy moth infestation in inspected products.--More infestations were located in products submitted for inspection during the first half of August than in any similar period during the past 15 years. This condition was evidently caused by increased gypsy moth infestation throughout the infested areas. Among important finds made were 50 gypsy moth larvae, 174 pupae, and 4 egg clusters found on 3 carloads of lumber inspected at Wescott, Maine, for shipment to Brooklyn, N. Y.; 2 larvae, 22 pupae, and 6 egg clusters removed from 8 truck loads of lumber moved from Amherst, Mass., to Avon, Conn.; and 3 larvae and 11 pupae taken from a truck load of stone transported from South Deerfield, Mass., to Greenwich, Conn.

Gypsy moth scouting results.--Gypsy moth scouting was concluded during August in a tier of Maine towns within lightly infested territory and adjacent to generally infested towns. Finds ranging from 2 to 848 gypsy moth egg clusters were made in 27 towns in Franklin, Kennebec, Oxford, Somerset, and Waldo Counties, bordering the generally infested zone. In all except 2 towns, 10 or more egg masses were found. Certification records indicate that only 10 carloads of Christmas trees were inspected in these towns during the past year.

Dutch elm disease area increased.--Three confirmations received on August 5 extended the total of the New Jersey work area. All three confirmations are located in Holmdel Township, Monmouth County. One of the trees had a diameter of 86 inches. Confirmation of 4 trees in Sparta Township, Sussex County, N. J., and 1 in Tewksbury Township, Hunterdon County, N. J., further extended the line of infection. The latter is the first confirmation of the disease in Hunterdon County. Confirmations in New York which increased the infected zone in that State involved 1 elm located near Mahopac Falls on the southern border of Putnam County, and a second tree near Milltown, in the town of Southeast, Putnam County. The confirmed tree at Mahopac Falls was found upon removal to show symptoms of infection in the 1934 and 1935 annual rings. An isolated confirmed tree near Scott Corner, Westchester County, N. Y., filled in a noninfected gap in territory already included in the infected zone without enlarging the zone. In New York the easternmost diseased tree is approximately 40 miles from the center of infection, and the westernmost point within the infected zone is approximately 40 miles from the infection center.

Fourteen diseased elms found in cities remote from major infected area.--Early in the month additional experienced supervisors were placed in the field to scout for the Dutch elm disease in cities remote from the major infected zone. These cities were selected on the basis of their importance from the standpoint of importation of burl elm logs, transportation of the logs, or their final use in veneer mills. Accordingly, the men were assigned to Louisville, Indianapolis, Boston, Chicago, Norfolk, Philadelphia, Baltimore, Dayton, Cleveland, New Orleans, and Kansas City. These supervisors obtained personnel for scout crews through the National Reemployment Service in the respective cities. By the end of the month 83 scouts were engaged in this distant scouting. Of a total of 188 suspects collected and sent in for culture, confirmations were returned of 10 infected trees in Indianapolis and 2 each in Cleveland and Norfolk. Trees affected with the disease had been found in each of these three cities in previous years.

Great Piece Meadows area of New Jersey to be made elm-free.--On August 5 work began on a clean-cutting program in Essex County area No. 1. This section has a total area of 5.49 square miles. Fifty percent of the area is marsh or waste land containing one of the heaviest infection centers in the entire zone. All elm trees in this section are being felled.

FOREST INSECT INVESTIGATIONS

Sawfly parasites received from Canada.--P. B. Dowden, of the Melrose Highlands, Mass., laboratory, reports on a shipment of parasites of *Diprion polytomum* received from the Dominion Parasite Laboratory, Belleville, Ontario. The parasite material was received at Melrose Highlands on August 21 and was liberated the following day near Portage Lake in northern Maine by J. V. Schaffner, Jr., in an infestation of the European spruce sawfly. The adult parasites were in excellent condition at the time of liberation. The following table indicates the species received.

Species	Males	Females
	Number	Number
Exenterus marginatorius	75	2,529
Lophyroplectrus luteator	92	158
Microcryptus basizonius	1,476	2,174
Microplectron fuscipennis	[1] 1,190	[1] 28,810

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[1] Estimated number of parasites of this species expected to issue from parasitized cocoons of the spruce sawfly which were placed in the field in wire cages. The sawfly cocoons were killed before being parasitized.

Gypsy moth attractants.--S. F. Potts, Melrose Highlands, reports on further developments concerning attractants to locate gypsy moth infestations. Results of this year's experiments show that a permanent type of mechanical trap caught 44 percent more moths than the tanglefoot trap now in use. It was found that the female tips may be discarded and the attractant may be stored in clear extract of known quantity and concentration per given volume in sealed ground-glass stoppered bottles, or preferably in vacuum-sealed cans. The extract stored in this way may be used in 15-tip dosages per trap instead of 30-tip dosages now used per trap.

Derris as a stomach poison.--Mr. Potts also reports that promising results have been obtained with derris as a stomach poison when oil adhesives are added. He states: "Although generally poor results have been obtained when uncoated derris was used as a stomach poison, very promising results were obtained on a number of insect species after exposure to varying periods of time and rain, when from 0.5 to 1.5 percent of castor oil, fish-oil, or linseed oil was added to the spray mixture."

Forest-type survey for gypsy moth.--W. L. Baker, Melrose Highlands, reports on a forest-type survey conducted in three Massachusetts towns. The areas surveyed in each town consisted of 18.25 square miles and the greater portion of these areas fell in the towns mentioned. Mr. Baker says that 2 weeks in August were spent in conducting forest-type surveys--1 week in Petersham, and 1 week in Beverly. J. E. R. Holbrook assisted in this work.

Fifty quarter-acre plots were located in each town. In Petersham 47 of the 50 plots contained tree growth, as compared to 30 of the 50 in Beverly. The remaining plots fell in tilled land, business districts, and pastures. Species of trees favored for the gypsy moth occurred in 40 of the 47 wooded plots in Petersham and 24 of the 30 in Beverly, or 85 and 80 percent, respectively. However, favored food trees predominated in but 19 percent of the wooded plots in Petersham, as compared to 33 percent in Beverly. These data may be compared with similar data from Concord, in which favored food trees occurred in 94 percent of the wooded plots and predominated in 54 percent. The gypsy moth was fairly destructive in Petersham in 1935 but occurred in damaging numbers only in practically pure stands of favored food trees. In Beverly no damage was done this season, and the gypsy moth was seen only in those plots falling in practically pure favored food stands. The Concord survey was made prior to the feeding season, when it was impracticable to obtain data on this year's infestation.

Control work effective against Douglas-fir beetle.--W. D. Bedard, of the Coeur d'Alene, Idaho, laboratory, recently conducted a survey of the Douglas-fir timber stands on the east side of Glacier National Park and reports that following control work conducted in the spring of 1934 the infestation of the Douglas-fir beetle (Dendroctonus pseudotsugae Hopk.) continues normal. Data taken from the vicinity of Upper St. Mary Lake showed a very low amount of infestation, most of the attacked trees being either windfalls or small suppressed trees. A survey of the Douglas-fir timber immediately adjoining the Park, on the Blackfeet Indian Reservation, indicated a 60 percent reduction in the Douglas-fir beetle infestation as a result of control measures conducted in the spring of 1935. This project had as its objective the protection of the Indian Service timber, as well as the safeguarding of the successful control work accomplished in the adjoining stands of the Park. Data obtained from this area showed an infestation of approximately 1/3 tree per acre, or 205 infested trees on the 641 acres infested. Owing to the proximity of valuable scenic Douglas-fir stands, it is deemed advisable to continue maintenance control in this area up to the time of emergence of the beetles in the spring of 1936.

Adult feeding habits of native elm bark beetle.--H. A. Crandell, of the Morristown, N. J., laboratory, reports that when adults of the native elm bark beetle (Hylurgopinus rufipes Eichh.) were confined with small healthy elm trees in cloth cages they fed not only on the twigs, particularly of the current season's growth, but also on the trunks. While this feeding was done under unnatural conditions, the observations suggest that similar injury may occur in the field.

No introduced bark beetles found at Cleveland, Indianapolis, and Norfolk.--During the month of August members of the Morristown laboratory staff, in company with workers of the Bureau of Plant Industry who are also stationed at Morristown, went to Indianapolis, Ind., Cleveland, Ohio, and Norfolk, Va., to examine trees infested by the Dutch elm disease and make observations in the immediate vicinity of these trees. While various native insects, or evidence of their attack, were noted on these elms, the examinations made indicate that neither of the European elm bark beetles, Scolytus multistriatus Marsh. nor S. scolytus Fab., has become established at these points. It has been thought that possibly the infections originated from elm logs of European origin that were shipped to or through the three cities and that either or both beetles might have been introduced.

Douglas-fir bark beetle aggressive following large fires in Oregon.--R. L. Furniss, of the Portland, Oreg., field laboratory, reports that many Douglas-firs are being killed during the current season in the northern coast counties of Oregon, owing to the activities of Dendroctonus pseudotsugae Hopk. Normally this species attacks weakened, felled, or fire-killed trees in the coast fir belt. However, because of a yearly succession of large fires from 1929 to 1933 in green timber in this area, an abundance of favorable host material was available in which the Douglas-fir bark beetle built up a huge population. In the spring of 1935 great numbers of these beetles emerged to find very few suitable trees to attack, as there was no large fire in 1934. As a result, some of the beetles filled in scorched trees adjacent to recent burns, but large numbers flew out into the green timber and attacked large groups of apparently normal trees. These groups are often many miles from the nearest burn of recent date and are attracting considerable attention from timber owners.

Black Hills beetle in lodgepole and limber pine.--J. M. Whiteside, of the Denver, Colo., laboratory, reports that recent caging experiments on Elk Mountain, near the Medicine Bow National Forest, Wyo., have confirmed the impression that far more brood of the Black Hills beetle (Dendroctonus ponderosae Hopk.) are developing to maturity under the bark of limber pine than in lodgepole pine in that locality. From emergence cages on 2 trees of each species, covering 8 square feet of bark surface, adult beetle emergence has been as follows: From limber pine, 193 beetles per square foot; from lodgepole pine, 20 beetles per square foot. Mr. Whiteside also reports that adults of the Black Hills beetle (Dendroctonus ponderosae Hopk.) emerging from lower elevations on Elk Mountain, northwest of Laramie, Wyo., were attacking many new trees near the top of the mountain before general emergence started at these higher elevations. This statement is based on evidence from emergence cages and attack records. It appeared that the adults emerging early in August at about 8,000 feet elevation were flying or being carried by the prevailing southwest winds to altitudes of 10,000 feet, where general emergence did not start until August 21. Prior to this date a sample strip 1 chain wide and 1 mile long, running from the base toward the top of the mountain, showed only 2 trees attacked in the lower half mile where emergence was far advanced, whereas in the upper half of the strip 122 newly infested trees were found, mostly in the last quarter mile, at from 9,800 to 10,000 feet elevation.

PLANT DISEASE CONTROL

Progress in barberry eradication.--Expansion of the barberry-eradication program in 17 States with W. P. A. funds was begun on August 1. On September 15 there were 1,814 men employed, 91 percent of whom had been taken from relief rolls. The field work is supervised by 131 agents who have had previous training and experience in plant disease control work.

Each supervisor is in charge of from one to four crews of from 5 to 10 men each, depending on the type of territory in which the work is being conducted. Subforemen have been obtained generally from among the men certified by the employment offices. On the basis of past experience, it is expected that the maximum number of men will be carried until about December 1.

Epidemiology of black stem rust.--In North Dakota this year the damage to Marquis wheat was found to range from 25 to 70 percent and to Ceres from 20 to 65 percent, while the Durums were much less severely injured. In weighing the samples it was evident that the excessively hot dry weather at the time most of the wheat was in the dough stage resulted in damage to the grain, even in fields of resistant varieties.

Summary of P. W. A. barberry-eradication program in Indiana.--From August 21, 1933, to June 30, 1935, National Industrial Recovery funds amounting to $32,615 were spent in connection with the barberry-eradication program in Indiana. Seventy-eight local laborers were employed for a total of 19,951 hours, making possible a survey of 1,009 square miles of territory in Allen, Dearborn, De Kalb, Elkhart, Fayette, Franklin, Henry, LaGrange, La Porte, Marion, Miami, Noble, Porter, Rush, Shelby, Steuben, Tippecanoe, Wabash, Wayne, White, and Whitley Counties. More than 12,000 bushes were destroyed on 298 properties.

Blister rust exhibit.--At the request of the Chairman of the Committee on Tree Conservation, a large outdoor blister rust control exhibit was placed at the Annual Flower Show at Bar Harbor, Maine, sponsored by the Garden Club of Mount Desert. This exhibit, which was 50 by 70 feet in size, was placed in an open space in a grove of native white pines ranging from 4 to 30 feet in height, with branch and stem cankers. Cultivated and wild Ribes (not infected) were displayed.

Ribes found in unusual locations.--In checking Ribes-eradication work around nurseries, it is interesting to note the unusual locations in which missed bushes were found. F. F. Franklin, in charge of this checking work in the North Central States, cites the following instances: In some nurseries in the North Central Region white cedars from swamps have been transplanted to form windbreak hedges along roadways in nurseries and among these cedars several Ribes have been found that were transported along with the ball of earth around the roots of the trees. At one nursery nine Ribes bushes were found growing under a house porch that was well within the nursery sanitation zone limit, and a 4-foot skunk currant was found growing beside a support for the overhead sprinkling system. At another, a Ribes cynosbati bush with 21 feet of live stem was found growing on an old log-sand crib. At still another, several R. cynosbati seedlings were found growing within the white pine seed beds. Apparently the Ribes seed was introduced there through woods dirt used in making compost. The compost was then used in preparing the seed beds.

Emergency relief workers swell ranks of blister rust fighters.--By August 31, 8,682 workers under the emergency relief program had been put to work on the blister rust control project. The States of Idaho and

California had the greatest number of these workers, 1,280 being engaged in Idaho and 1,228 in California.

W. P. A. workers eradicate Ribes in Virginia.--During the month of August, 36 W. P. A. workers in Virginia eradicated 12,865 wild and 31 cultivated Ribes on an area of 1,797 acres. This work extended over four counties and consumed a total of 3,178 man-hours of labor.

COTTON INSECT INVESTIGATIONS

Improved agitator for duster.--The vertical agitator designed by D. A. Isler, of the Bureau of Agricultural Engineering at the Presidio, Tex., pink bollworm laboratory, was installed on a power duster and performed very satisfactorily in field tests with barium fluosilicate and sulphur-derris mixtures. An adjustable feed lever stop was also constructed so that the feed could be cut off when turning at the row ends and cut on again to exactly the same setting.

Rearing pink bollworm parasites.--L. W. Noble and assistants, of the Presidio laboratory, report excellent results from a new rearing method which is being used for the pink bollworm parasite Microbracon kirkpatricki Wilk. recently introduced from Egypt. They state: "The oviposition cage is a wooden frame 12 by 13 by 14 inches, inside dimensions, with the cloth cover fastened on the inside to prevent the parasites from wedging themselves between the cloth and the wood frame. The host larvae are exposed in embroidery hoops. They are confined between a sheet of heavy paper and a piece of cloth stretched in the hoop. The hoop is fastened on the outside of the cage with the cloth pressed against the cloth cage cover. The parasites oviposit through the two layers of cloth, that of the cage cover and that fastened in the hoop. By this method the host larvae are exposed without opening the oviposition cage. The hoops are removed and a fresh lot of larvae exposed every 24 hours. The host larvae with the young parasite larvae are allowed to remain in the hoops until the parasites have completed development and spun cocoons. All of these cocoons are attached to the sheet of paper, allowing removal of the pieces of cloth without disturbing the spin-ups. The pieces of paper containing the spin-ups may be placed in emergence cages or prepared for shipment."

Another pink bollworm parasite.--Mr. Noble also says that the second generation of the Hawaiian parasite Chelonus blackburni Cameron, bred from a small lot of material received in June, began emerging late in August. This species was found to breed on Ephestia kuehniella Zell. and Sitotroga cerealella Oliv., although the specimens are considerably smaller than those developing on pink bollworms. Small liberations of Exeristes roborator Fab. were made in Mexico in August by C. S. Rude, who is continuing the breeding work with this species for further liberation.

Longevity of boll weevils.--G. L. Smith, et al., Tallulah, La., report that in May 1935, 35 boll weevils emerging in hibernation cages where they had been placed during the fall of 1934 were placed in screen cages in the insectary and were supplied daily with fresh cotton plants or squares for food. Twenty-one, or 60 percent, died in May and June; 6, or 17 percent, in July; and 6, or 17 percent, in August, leaving only 2, or nearly 6 percent, of the weevils still alive on September 1, 1935.

Notes on flight-screen collections of boll weevils.--R. C. Gaines and G. L. Smith report that the flight-screen collections of boll weevils at Tallulah indicate a smaller August boll weevil population than during any of the 5 previous years. The number of weevils caught per flight screen during August 1935 was only 13, as compared to 43 in 1934, 151 in 1933, 134 in 1932, and 78 in 1931. The small boll weevil population during August 1935 was undoubtedly due to the high temperatures and drought during July and August, which caused cotton to mature unusually early, leaving very few squares and young bolls for weevil food and breeding. The collections made during August on the three revolving flight screens confirm previous observations that the boll weevil has a tendency to fly against the wind. In August 1935, 4 weevils were caught on the windward side of the screens while 13 were caught on the leeward side. During the same month in 1934, 22 weevils were caught on the windward side and 43 on the leeward side of these screens.

Boll weevil parasite studies.--P. M. Gilmer, et al., report that by the end of August boll weevil infested cotton squares had been placed in 139 cages for parasite emergence at Tallulah and emergence had been completed in 89 cages. In August all parasites and weevils were removed from 60 cages representing collections made at 41 points in four States. Two of the cages contained cotton squares from Arkansas; 6 contained squares from Alabama; 20, squares from Louisiana; and 32, squares from Mississippi. From the 30,644 squares in the 60 cages there emerged 15,693 boll weevils and 1,100 parasites, of which 962 have been tentatively determined as Microbracon mellitor Say and 138 as other species. The percentage of squares containing boll weevil parasites ranged from 0 to 32.80 percent of the productive squares. This high percentage of parasites was from 402 cotton squares collected at Aberdeen, Miss., on July 16, 1935. Four collections--2 from Aberdeen, Miss., 1 from Starkville, Miss., and 1 from Gallion, Ala.--had over 20 percent parasites. The average percentage of parasites remained persistently high from collections made at Aberdeen, Starkville, and Stoneville. An attempt was made with the data at hand to discover whether there was any significant increase in percentage of parasitization during the season. The data to date are insufficient to afford any basic generalizations but seem to support rather well the viewpoint that there is little or no build-up at any time and that the small increase that does appear is lost late in the season, apparently rather from decrease in parasite activity than from increase in boll weevil numbers, as the percentage of productive squares has shown little increase. The very hot weather seemed to react less unfavorably upon parasites than upon weevils, as it was accompanied by slight increases in parasite percentages which were lost with the return of cooler weather. In general, parasitization just about held its own with weevil increase, resulting in a rather stable percentage through the month. One or two points again showed a slow build-up, notably at Starkville, while at Natchez there seemed to have been a steady decline in percentage, which, although very small, was consistent from collection to collection.

Cage toxicity tests for flea hopper.--K. P. Ewing and R. L. McGarr submit the following data on insecticides and combinations of insecticides used in cage toxicity tests for the cotton flea hopper at Port Lavaca, Tex.

Insecticide	Concentration	Mortality: Adults	Mortality: Nymphs	Mortality: Average (both stages)
	Percent	Percent	Percent	Percent
Paris green-sulphur [1]	5.0	64.8	67.6	66.2
Do [2]	7.5	80.7	71.6	76.2
Do [1]	10.0	66.2	77.9	72.1
Calcium arsenate sulphur	10.0	44.9	76.3	60.6
Do	20.0	49.2	70.8	60.0
Do	33.3	49.0	66.7	57.9
Sulphur	---	43.0	78.8	60.9
Phenothiazine	---	39.2	19.5	29.4
Phenothiazine with 50 percent clay	50.0	35.7	28.8	32.3

[1] Mixed by machine at Tallulah.

[2] Mixed by hand just before using.

The average mortality in 22 check cages was: Adults,16.8; nymphs, 23.5. These mixtures of paris green and sulphur were also tested in the field this year. Two applications gave very good control of the flea hopper and caused no burning of the foliage. To further test the effect on the plant, from 3 to 6 applications of the different paris green-sulphur mixtures were applied to late cotton at the rate of 18 pounds per acre per application without causing any burning even in the presence of heavy dew.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Gin-trash inspection.--Gin-trash inspection of the 1935 cotton crop is now well under way. This work was begun early in August in the lower Rio Grande Valley of Texas and adjacent areas in Mexico, and also in the Don Martin Project, located about 40 miles in the interior of Mexico opposite Laredo, Tex. All of these areas have now been completed. The machines have moved northward as the season progressed and are now being operated in central and west-central Texas. Inspections are just getting under way in Louisiana and Mississippi, an inspection crew being located in each State. Inspections were begun in the regulated areas of Florida and Georgia and adjacent territory about the middle of August, and by the end of the month 11 machines were in operation. The results of all gin-trash inspection to date have been negative. As gin-trash inspection goes forward, arrangements are being made to collect green bolls for future laboratory inspection in the sections not covered by gin-trash inspection.

Trap-plot cotton in the Big Bend area of Texas.--The trap-plots of cotton in the Castolon section were continued until the middle of the month, at which time two of them were discontinued. From these two plots 69,862 blooms had been inspected in the first half of the month and 647 worms were found. The other plot was worked during the entire month, 137,405 blooms being inspected and 10,520 worms being found. In the plots that were discontinued all infested blooms were picked daily, and 738 such blooms were collected during the last half of the month. The last few days of August some 38 bales of cotton was ginned at Presidio. The trash was not put through a machine, but an inspector made a general examination by hand and found that there were very few pink bollworm larvae at this time.

Road-station inspection.--The inspection station at the junction of the Presidio and Ruidosa roads, about a mile and a half south of Marfa, Tex., was reopened on September 3. This station is for the purpose of preventing the movement of infested material from the Big Bend area of Texas. The station will be operated on a 24-hour basis by 4 temporary inspectors, 3 of whom have had previous road-station experience.

Thurberia weevil clean-up in Arizona.--Late in August the eradication of Thurberia plants in the regulated area of southern Arizona was begun with funds provided by the P. W. A. These funds permit the employment of 227 men for 1 year. Equipment was essential to start activities and, as some of this has not been received, the work has naturally been handicapped. During the last few days of the month some 72 men began the actual work of removing the plants and the progress being made is very gratifying. Some of the laborers have been out of work for a considerable time and they are very enthusiastic and seem to be interested in the work. For the 5 days of the month during which eradication work was performed, some 15,900 Thurberia plants were removed. As soon as the necessary supplies are received the remainder of the personnel will be employed.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Officials visit control areas.--In June J. H. French, secretary of the Pennsylvania Department of Agriculture, accompanied by deputy-secretary W. S. Hagar and R. H. Ball, director of the Bureau of Plant Industry, visited the gypsy moth infested area in Pennsylvania and observed the spraying, cutting work, etc., which was done or was in progress at that time. This was Mr. French's first visit to this area and he was very much interested in the work and the organization. On July 5 a number of gypsy moth foremen from the Massachusetts and Connecticut C. C. C. camps visited a number of the towns just east of the Connecticut River, in Massachusetts, to observe the widespread gypsy moth defoliation. A C. C. C. camp superintendent and representatives from the office of the commissioner of conservation of Massachusetts also attended. During the latter part of June and the early part of July the following-named men visited much of the territory heavily defoliated by the gypsy moth: L. S. McLaine, chief, division of foreign pest suppression of Canada, and his assistant, William Keanan; H. L. McIntyre, director of forest pests and diseases of New York Conservation Department; N. R. Trafton, of the Maine Department of Agriculture; J. T. Ashworth, deputy in charge of gypsy moth control in Connecticut; Messrs. Davis and Hanley of the gypsy moth office at Wilkes-Barre, Pa.; H. A. Ames, in charge of gypsy moth work in New Jersey; A. F. Hawes, State forester of Connecticut; and Messrs. Brown, Baker, and McAloney of the forest-insect laboratory at Melrose Highlands, Mass.

Autogiro aids in gypsy moth survey.--During early July, colored moving pictures of large gypsy moth defoliated areas, just east of the Connecticut River, were taken from an autogiro. This is the first time colored films have been used in taking pictures of gypsy moth defoliation from the air. This type of plane made it possible to obtain a nearer view of the defoliated areas from above. These films have been finished, presented for criticism, and are now being put in final shape for showing.

Notes on personnel.--In August men thoroughly experienced in gypsy moth control work were detailed to Maine and New Hampshire to survey a part of certain counties where work is planned in order to locate areas where gypsy moth egg clusters are fairly abundant. These areas are to be used in training inexperienced men for gypsy moth work, such as thinning, cutting, scouting, and creosoting of egg clusters. After the men have secured sufficient training, and transportation is available, these men will be assigned work in districts where the infestations are much lighter. Up to August 28, 1935, under the W. P. A. emergency projects a total of 982 workers have been requisitioned under the gypsy moth project, 559 having reported for work in the States as follows: New Hampshire, 12; Vermont, 30; Massachusetts, 123; Rhode Island, 27; Connecticut, 117; and Pennsylvania, 232. Most of the workers obtained are inexperienced and have not been employed for some time. Those obtained thus far are performing reasonably satisfactory work. In the Pennsylvania area a small group left the work, apparently being dissatisfied with their wages.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Crude naphthalene effective against wireworms.--M. C. Lane, of the Walla Walla, Wash., laboratory, reports that a recent large-scale field test has demonstrated conclusively the value of crude naphthalene in combating wireworms under conditions existing in the State of Washington. In these tests crude naphthalene was applied at the rate of 800 pounds per acre. The land was plowed 12 inches deep with a riding plow set to cut a 9-inch furrow slice. The crude naphthalene crystals were applied to the sides of the open furrows immediately behind the plow. After the plowing was completed the soil was thoroughly disked to obtain a complete mixture of the naphthalene and the soil. After disking the soil surface was packed with a platform "float" in order to retain the gas in the soil. Before treatment the 2-acre field contained an average of approximately 38 wireworms per square foot in the top 12 inches of soil. Ten days after the completion of the treatment a similar examination revealed an average of only 1 wireworm per square foot, an apparent reduction of approximately 97 percent as a result of the naphthalene treatment. The cost of the treatment averaged approximately $24 per acre. The principal species of wireworms concerned were the sugar beet wireworm (Limonius californicus Mann.) and the Pacific coast wireworm (Limonius canus Lec.).

Nicotine sulphate-fish oil soap gives promising results against tomato pinworm.--J. C. Elmore, Alhambra, Calif., reports that in recent laboratory tests it was indicated that a combination of nicotine sulphate (1-800) and fish oil soap (1-200), in water, may prove of considerable value in combating the tomato pinworm (Gnorimoschema lycopersicella Busck) when directed primarily against the egg and the leaf-mining stages. Preliminary tests thus far have indicated a reduction of approximately 92.6 percent in pinworm moth emergence from tomato plants treated with the nicotine sulphate-fish oil soap preparation, as compared to untreated plants.

Derris dusts effective against cucumber beetles when applied directly.--Reporting on a series of tests with three species of cucumber beetles (Diabrotica spp.), K. B. McKinney, of the Phoenix, Ariz., laboratory, states that the direct application of a derris-talc dust mixture containing 1 percent rotenone killed from 86.1 to 99.8 percent of the adult beetles, as shown by the examination of the beetles 24 hours after the dusting was completed. In these tests the beetles were collected by the sweep-net method from wild gourd vines on the desert. They were liberated within a screened enclosure and were treated with the dust mixture after they had settled on the screen. Judging from the results obtained in these tests, it seems possible that derris dust mixtures containing approximately 1 percent of rotenone should prove very effective when applied directly to cucumber beetle adults. The species involved in these tests were the striped cucumber beetle (D. vittata Fab.), the spotted cucumber beetle (D. duodecimpunctata Fab.), and the banded cucumber beetle (D. balteata Lec.).

Sprays superior to dusts in control of Mexican bean beetle in Virginia.--R. W. Brannon, of the Norfolk, Va., laboratory, reports that preliminary results from a large-scale control experiment on lima beans in the field at Mappsville, Va., have indicated that, in general, sprays gave better foliage protection against the Mexican bean beetle than did dusts. A spray composed of 3 pounds of synthetic cryolite in 50 gallons of water and a derris-root-powder spray containing 0.025 percent rotenone, gave perfect foliage protection against the bean beetle and increased the yield 38 and 33.5 percent, respectively, as compared to similarly situated untreated plots. A dust mixture composed of synthetic cryolite and talc (60-40) and a derris-talc dust containing 0.22 percent rotenone, gave fairly satisfactory results and increased the yield 32.9 and 23.8 percent, respectively, as compared to untreated plots. These materials were applied with a traction duster and traction sprayer, respectively, on half-acre replicated plots.

Macrocentrus ancylivorus parasitizes larvae of lima bean pod borer.--Rodney Cecil, of the Ventura, Calif., laboratory, reports that adults of the parasite Macrocentrus ancylivorus Rohw. have emerged from larvae of the lima bean pod borer (Etiella zinckenella Treit.), to which they were exposed in experimental tests. Adults of this parasite were shipped from the Moorestown, N. J., laboratory, in an attempt to determine their possible utility as a natural enemy of the lima bean pod borer. As it has been demonstrated that *M. ancylivorus* will parasitize the larvae of *E. zinckinella*, the effort will be continued to determine whether it is possible to establish this parasite in the Ventura district as a possible aid in the control of the lima bean pod borer.

Ground root of fetid wild gourd and manroot show promise as insecticides.--In preliminary tests with the ground root of fetid wild gourd (*Cucurbita foetidissima*) and manroot (*Echinopcystus fabacea*) against nearly full-grown larvae of the imported cabbage worm (*Ascia rapae* L.), R. E. Campbell, of the Alhambra, Calif., laboratory, reports that these materials exhibited a marked toxic and deterrent effect on the worms. The tests included the application of the finely ground root in a pure state and also diluted with equal parts of talc by weight. A precision duster and settling cone chamber was used in applying 1 gram of the dust per cabbage plant. When the wild gourd root was used the percentage of worms killed ranged from 17.5 to 20. With the manroot the percentage of kill ranged from 5.0 to 55. It is planned to continue tests with these materials in order to determine more definitely their possible utility as insecticides.

INSECTS AFFECTING MAN AND ANIMALS

Screw worm incidence shows slight increase in Southeastern States.--During the third week of August there was a slight increase in the number of screw worm cases in livestock in southeastern Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, and South Carolina. This is accounted for by the increased activity of the Gulf coast tick, one of the principal predisposing causes of screw worm attack in the Southeast. Reports from certain sections of southwestern Texas indicate that there was a noticeable decrease in screw worm infestations in that area during the latter part of August on account of the hot, dry weather.

Bureau may undertake pest-mosquito control project.--In order to meet requests from various States and local communities that the Federal Government undertake control measures against pest mosquitoes, to lessen the danger of outbreaks of certain diseases carried by these insects, and to insure that work of this kind may be carried out with the least possible detriment to wild life and other natural resources, the Bureau of Entomology and Plant Quarantine has made application to the Works Progress Administration for an allotment of $34,095,361 to carry on this work. The project is designed to furnish employment to 53,286 laborers now on relief rolls and to provide for employing 1,385 additional men for a period of 12 months. Of the total cost of the project, 85.9 percent is to be used for wages for relief labor, 5.5 percent for supervision, and only 8.6 percent for expenses other than wages. The average annual salary of all men employed on the project will be $639.86. If the project is approved by the Works Progress Administration, pest-mosquito control work will be conducted in 29 States and the District of Columbia.

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--Living larvae of the Mediterranean fruit fly were intercepted at Boston on June 21 in grapefruit in stores from Palestine. This fruit fly has been taken previously in oranges from Palestine. Seven adults of the lygaeid *Nysius huttoni* B. White were intercepted at New York on May 29 on apples in cargo from New Zealand. A nest containing living immature larvae of the brown-tail moth (*Nygmia phaeorrhoea* Don.) arrived at Washington, D. C., on March 5, 1934, with a pear tree in the express from Italy. A living nymph of the cricket *Liphophus kanetataki* Matsumura was found at Seattle, Wash., on June 11 in a basket of *Dioscorea* in baggage from China. A living larva of *Psylliodes chrysocephala* L. was taken at Houston, Tex., on June 10 in a turnip in stores from Argentina. This is our first record of this chrysomelid being intercepted from Argentina. Living specimens of the coccid *Phenacoccus azaleae* Kuw. arrived at Philadelphia on February 20 on leaves and stems of azalea in ship's quarters from Japan. Twenty-seven living larvae of the pink bollworm (*Pectinophora gossypiella* Saund.) were taken at Washington, D. C., on December 19, 1934, in unginned cottonseed in the mail from Greece. This represents the first record in our files of this insect being intercepted from Greece. A larva of the pyralid *Ancylostomia stercorea* Zell. was taken at New York on May 27 in a pigeonpea (*Cajanus indicus*) in baggage from Puerto Rico. A living adult of *Anchastomorphus suturalis* Cand. arrived at Baltimore, Md., on April 29 with banana debris in cargo from Colombia. This is the first record in our files of this elaterid being intercepted. A living adult of the leaf beetle *Doryphora princeps magnifica* Stal was taken at Charleston, S. C., on April 15 with banana debris in cargo from Honduras. *Coccus capparidis* (Green) was intercepted at San Francisco on June 17 on orchids (*Cypripedium fairieanum* and *C. villosum*) in the mail from India. A living adult of the mango weevil (*Sternochetus mangiferae* Fab.) arrived at New Orleans on June 10 in a mango in crew's quarters from the Canal Zone. A member of the crew stated that he obtained the mango fruit in the Canal Zone. This represents our first record of this weevil being intercepted from the Canal Zone; however, as the vessel sailed direct from Honolulu it is possible that the mango came from Hawaii.

Pathological interceptions of interest.--The first interception of *Ascochyta berberidina* Sacc. was made at Seattle on April 24 on barberry from Germany. *Ceratostomella* sp., unlike *C. fimbriata* Elliott, was intercepted on taro from China on April 24 at New York. *Cladosporium carpophilum* Thuem. was intercepted from Japan for the first time on August 11, at San Pedro on peaches. The first interception of the genus *Cryptodiaporthe*, *C. salicina* (Curr.) Wehm., was made at Seattle on April 16 on willows from Belgium. *Gloeosporium catechu* Syd. was intercepted on April 12 at Seattle in betel nuts from Guam. *Gloeosporium* sp., with spores smaller than for species reported on host, was intercepted at New York on April 19 on *Hoya carnosa* from Italy. *Pestalozzia glandicola* (Cast.) Guba was intercepted (first interception) on oak from Japan on March 25 at Seattle. *P. macrotricha* Kleb. was intercepted (first interception) on rhododendron from England on April 5 at Seattle. *Phoma ejiciens* Pass. was intercepted (first interception) on camellia from Japan on April 5 at Seattle. *P. gulibrissen* Pass. and Roum. was intercepted (first interception) on *Albizzia lebbek* from British West Indies on March 27 at New York. *P. pachytheca* Vesterg. was intercepted (first interception) on willows from Belgium on April 16 at Seattle. *Phyllosticta* sp., no species reported on host genus, was intercepted on April 8 at Seattle on *Shortia uniflora* from Japan. *Physalospora cattleyae* Maubl. & Lasnier was intercepted on May 2 at New Orleans on *Cattleya skinneri* from Guatemala. The only previous interception of this disease was made in 1915 on orchids from Colombia. The first interception of *Puccinia magnusiana* Koxern. was made on May 27 at New York on *Phragmites communis* from China. The first interception of *Pucciniastrum myrtilli* (Schum.) Arth. was made on July 29 at Seattle on *Vaccinium* sp. from Yugoslavia. *Rhabdospora* sp. (no species reported on host) was intercepted on April 5 at Seattle on camellia from Japan. *Septoria gladioli* Pass. was intercepted on crocus for the first time on August 5 at New York in bulbs from Holland. *Septoria rubi* Westd. was intercepted (first interception) on thimbleberry from Canada on August 12 at Seattle. *Sphaeropsis* sp., similar to *S. malorum* Pk., was intercepted in sweetpotatoes from Sierra Leone on May 13 at Boston. *Sphaerulina* sp., no species reported on host, was intercepted at Seattle on April 8 on peony from Japan. *Tilletia horrida* Tak. was intercepted in paddy rice at Seattle on April 15, first interception from Siam.

Fruit fly on Spanish liner in Puerto Rico.--Inspectors detailed to inspect the stores of a Spanish liner entering San Juan in September took small samples of the various fruits in the ship's stores and started to work on them. Soon larvae of the Mediterranean fruit fly (*Ceratitis capitata*) were found, every pear examined yielding 2 or more. Actual counts for these 7 pears were 42-18-19-6-27-8-2 larvae. In addition to the pears, 1 of the 6 apples was found to contain 3 larvae. To quote from the report, "It is also interesting to note that 1 pear, selected as probably free from infestation, had 19 larvae, while another, which the ship's steward swore was clean, had 2 larvae." The presence of fruit infested with fruit flies in ships' stores of vessels arriving at tropical ports represents the maximum of pest risk. Not only is the climate admirably suited to the rapid and continued development of these pests but there is an abundance of preferred host fruits available. This incident forcibly illustrates the need for prompt and careful inspection of fruit in ships' stores on vessels arriving from countries in which fruit flies are known to occur.

Spanish peaches infested with fruit fly.--Of 126 Spanish peaches found in a ship's stores in Boston on September 2, all showed evidence of attack by the Mediterranean fruit fly. Of 30 cut open, 25 contained living larvae, 59 being the largest number found in any one fruit. Another peach found in a passenger's baggage contained 8 living larvae. All of this infested fruit was burned.

DOMESTIC PLANT QUARANTINES

Relief workers inspect peach trees for mosaic disease.--Reports from the manager of the project on control of peach mosaic show that up to September 7 inspection had been made of 467 properties and 94,554 peach trees in Delta County, Colo. No peach mosaic was found in the area inspected. Sixteen men from relief rolls were being employed in crews of 4, under the immediate supervision of a trained inspector. Other crews are to be employed for inspection work in Mesa County, Colo., as soon as the peach crop is harvested.

Progress in phony peach disease inspection.--The project leader reports that the season's work in inspection of home and commercial orchards for the phony peach disease has been completed in 7 States, of which 2, New Jersey and West Virginia, yielded no instances of known infection, and 2, Maryland and Kentucky, were found infected this season for the first time. The infected counties in Maryland are Washington and Worcester. Those in Kentucky are Henderson, Graves, Union, and Webster.

Field headquarters changed.--The field headquarters for phony peach disease eradication, which have been maintained at the peach-disease laboratory, Fort Valley, Ga., for several years, were moved on August 22 to 308 Ten Forsyth St. Building, Atlanta, Ga., a location which is proving to be much more advantageous in the efficient administration of the relief project on the control of the phony peach disease. The Texas headquarters for citrus canker eradication were moved from the old Federal building at Houston to Room 315, Citizens State Bank Building, in the same city, and a temporary field office has been established in the Rio Grande National Life Building at Harlingen.

Cactus burners used for killing Citrus trifoliata seedlings.--Seedlings of the Citrus trifoliata are produced in such great numbers as to present a problem in connection with the eradication of escaped Citrus trifoliata for control of the citrus canker. A portable type of blow-torch, locally known as a "pear burner", because of its use by stockmen in burning the spines from the prickly pear, is being used with apparent success to burn the seedlings and litter containing the seeds.

Progress of citrus canker eradication under P. W. A. funds.--Relief workers employed in the Harlingen, Tex., area on the citrus canker eradication project have accomplished the destruction of 56,360 trees in the Harlingen area and 33,178 in the Brownsville area up to September 1, according to reports from field headquarters. Most of these were overgrown and abandoned nursery trees. Abandoned orchards are next to be worked. The volume of work is increasing in the lower Rio Grande Valley, a sufficient number of applications having been received to keep the 200 laborers busy for the next 3 months.

Citrus canker again found in Louisiana.--Inspectors report that at Schriever, Terrebonne Parish, La., where the disease was found a year ago, citrus canker was again recently located on an escaped Citrus trifoliata tree. All trifoliata trees in this area are now being destroyed by the use of relief labor. This infection is not near the commercial citrus plantings of the State.

Railway cars from Japanese beetle area inspected.--Inspections of cars of produce arriving at Chicago and Cincinnati from the areas infested with the Japanese beetle were continued during August, the season when the beetle is in flight, and one live beetle was found as a result of the inspection of 75 cars.

Azalea flower spot quarantine proposed.--The Maryland Nurserymen's Association went on record at a recent meeting as favoring a public hearing looking to the establishment of a quarantine of areas in the South that are infected with the azalea flower spot. The State of Alabama placed a quarantine last April, prohibiting the entry of azalea from South Carolina, where the disease was first recorded in the Charleston area. The State of California requires certification as to this disease in shipments of azalea from South Carolina, Georgia, and Florida.

BEE CULTURE

Beekeepers manifest interest in A. A. A.--The beekeepers have been very much interested in the status of the Agricultural Adjustment Administration, because the marketing agreement covering the sale of package and queen bees is involved. The Alabama State Beekeepers' Association, at its recent meeting, went on record as favoring for another year the continuance of the prices established last year under this agreement.

Maryland honey exhibit judged.--On September 3 C. E. Burnside, Somerset, Md., officiated as judge of apiary products at the Maryland State Fair at Timonium. He reports that the exhibits of both comb and extracted honey were of excellent quality. The combination exhibits were especially attractive. The number of entries were less than expected, probably on account of inclement weather.

INSECT PEST SURVEY AND INFORMATION

Suggestion on photographing insects.--J. G. Pratt, bureau photographer, says that the pinning into position of insects, especially minute Coleoptera, can be greatly facilitated by making a fork at the end of a standard insect pin with a pin of the minuten variety and a bit of solder. The operation is simple and it takes but a few minutes to make an adequate supply. File off the paint where the joint will come; stick the two into cork in the desired position and touch the joint with an electric soldering iron. For minute Coleoptera, 2 minuten pins can be used. The great advantage in controlling the position of an insect leg or antenna with a single pin is readily apparent.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

The mosquito Aedes fulvus Wied. in Cuba.--Carlos G. Aguayo, of Havana, Cuba, recently brought in three specimens of A. fulvus, collected at Cacocum, Oriente Province, Cuba, on July 25, 1935. Dr. Aguayo said that this species is very abundant and is much feared by the natives because of its ferocity. This is the first Antillean record of a species known from North Carolina south through Central Amercia to Brazil.

A European pemphredonid wasp and its parasite in the United States.--On several occasions in the past 2 years, F. D. De Gant, of Cleveland, Ohio, has sent in specimens of an ichneumonid which he had reared, along with its wasp host, from rose stems in his garden. The parasite has been identified by R. A. Cushman as Perithous divinator (Rossi), a European species not

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heretofore recorded from North America. Grace Sandhouse has identified the wasp, with some question, as *Pemphredon* (*Dineurus*) *lethifer* (Shuckard), a species recorded in European literature as one of the hosts of *P. divinator*. It has not previously been recorded from North America, although the collection of the National Museum contains specimens from Rosedale, Mass.; Philadelphia, Pittsburgh, and North East, Pa.; Baltimore, Md.; Washington, D. C.; Cleveland and Wooster, Ohio; Detroit, Mich.; Chicago, Ill.; and Webster Grove, Mo. All but the Philadelphia specimen, which was captured in 1909, have been collected since 1922. Many of them were reared from rose or blackberry stems.

Males of Dinocampus coccinellae (Schrank) discovered.--In the course of a study by C. F. W. Muesebeck of material in the National Museum belonging to the braconid subfamily Euphorinae, two male specimens of *D. coccinellae* have been discovered. This species, which is a common cosmopolitan parasite of adult Coccinellidae, has been supposed to occur only in the female sex. The recording of a male in 1834 by Nees von Esenbeck (whose collection has since been destroyed) has been generally regarded as probably representing a misidentification. The two male specimens in the National Collection are from California and were reared, respectively, from *Hippodamia convergens* Guer. and *Coccinella californica* Mannh.

Chinch bug egg parasite found in Virginia.--*Eumicrosoma benefica* Gahan, a minute telenomine parasite of the eggs of the chinch bug (*Blissus leucopterus* Say) appears to have been reported only from certain States west of the Mississippi, specifically from Kansas, Iowa, and South Dakota, and from Illinois following introduction from Kansas. Recently, however, F. F. Dicke, of the Division of Cereal and Forage Insect Investigations, submitted specimens, identified by C. F. W. Muesebeck as this parasite, which were reared from eggs of *Blissus hirtus* Montd., at Arlington Farm, Va.

A West Indian species of Miridae injurious to tobacco in Florida.--Specimens of two species reported by A. W. Morrill, Jr., on August 7, as being abundant on tobacco plants at Quincy, Fla., have been identified by H. G. Barber as *Cyrtopeltis varians* Distant and *Dicyphus mimus* Uhler, respectively. The former has not previously been reported as injurious to tobacco in the United States, although known as a tobacco pest in Cuba and Puerto Rico.

A European leafhopper in western United States.--On June 27 at Nicolaus, Calif., and July 5 at Puyallup, Wash., P. W. Oman collected specimens on cottonwood which he has identified as *Idiocerus albicans* Kbm., apparently the first records for this species from North America. There has also been received for identification a single female of an *Idiocerus*, collected at Pullman, Wash., on October 13, 1929, which Mr. Oman tentatively placed as *I. fulgidus* Fab. Both are European forms living on *Populus*. Mr. Oman suggests that, if the latter identification is correct, all the above-mentioned specimens probably represent but a single species, as material in the National Collection under the name *albicans* does not appear to be specifically distinct from that considered to be *fulgidus*.

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